User Manual

Connection to 3S PLCHandler

Part Number:	80860.776
Version:	1
Date:	2011-07-15
Valid for:	TSwin .net 4.3

Version	Date	Modifications
1	2011-07-15	First Edition

This manual, including all illustrations contained herein, is copyright protected. Use of this manual by any third party in departure from the copyright provision is forbidden. No part of this manual may be reproduced, translated or electronically or photographically archived or altered without the express written consent from Sütron electronic GmbH. Violations shall be cause for damage liability.
Sütron electronic reserves the right to make any changes that contribute to technical improvement.

Overall Table of Contents

1 Important Notes 1-1
1.1 Symbols 1-1
1.2 Safety Notes 1-1
1.3 Intended Use 1-1
1.4 Target Group 1-2

2 3S PLCHandler 2-1
2.1 Data Types 2-1
2.1.1 Single Variables 2-1
2.1.2 String Variables 2-1
2.2 Programming 2-2
2.2.1 Protocol Parameters 2-2
2.2.1.1 PLC version 2-2
2.2.1.2 Offline Operation 2-2
2.2.1.3 Connection Name 2-3
2.2.1.4 Device Node Name 2-3
2.2.1.5 Variable List *.sym/*.xml 2-3
2.2.1.6 Controller Address 2-4
2.2.1.7 Gateway Address 2-4
2.2.1.8 Port Number 2-4
2.2.1.9 Byte Order 2-5
2.2.1.10 TCP/IP Protocol 2-5
2.2.1.11 PLC Multiplexing 2-5
2.2.2 Polling Area 2-5
2.2.3 Status Messages 2-6
2.2.4 Date and Time 2-6
2.2.5 Variant Buffer 2-6
2.2.6 Tables 2-6
2.3 Error Messages 2-8
2.4 Migration of 3S sarti projects 2-9

A Index A-1

1 Important Notes

1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER
This symbol is used to refer to instructions which, if ignored or not carefully followed, will result in death or serious injury.

WARNING
This symbol is used to refer to instructions which, if ignored or not carefully followed, could result in death or serious injury.

CAUTION
This symbol is used to refer to instructions which, if ignored or not carefully followed, could result in minor or moderate injury.

NOTICE
This symbol and the accompanying text alerts the reader to a situation which may cause damage or malfunction to the device, either hardware or software, or surrounding property.

Reference to source of information
This symbol refers to detailed sources of information on the current topic.

1.2 Safety Notes

- Read this manual carefully before using the software. Keep this manual in a place where it is always accessible to all users.
- The user manual, in particular the safety notes, must be observed by all personnel working with the software and the programmed device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

1.3 Intended Use

- The software has to be used for programming operating devices exclusively. Every other use is not permitted.

1.4 Target Group

All configuration and programming work in connection with the automation system must be performed by trained personnel only (e.g. qualified electricians, electrical engineers).

The configuration and programming personnel must be familiar with the safety concepts of automation technology.

2 3S PLCHandler

The 3S PLCHandler protocol allows the connection to current 3S runtime systems. The operating device communicates via TCP connection of the ethernet interface. The protocol provides random read and write access to all global data objects of the PLC.

The programming software adopts the data objects of the project_name.SYM (CoDeSys 2.x) or project_name.XML (CoDeSys 3.x) file which are created when the CoDeSys project is compiled.

The operating device uses the symbolic name to access a data object.

2.1 Data Types

The length of a variable is determined by the length defined in the programming software CoDeSys.

2.1.1 Single Variables

You can access variables of the following type: BOOL, BYTE, WORD, DWORD, SINT, INT, DINT, USINT, UINT, UDINT, REAL, and STRING. Floating point numbers are interpreted in IEEE format. The variable type REAL is required for this purpose.

2.1.2 String Variables

For string variables, the variable type STRING(N) is used, where N is the length of the string.

Please note that the length of the string variables in the symbol file is by 1 larger than defined.
Example: STRING(40) has a length of 41.

2.2 Programming

2.2.1 Protocol Parameters

2.2.1.1 PLC version

Select the CoDeSys version of the target system. The selection of the version affects the available communication parameters.

Table 2-1 PLC Version

Configurable Values	Default Value
V2.x (ARTI interface)	X
V3.x (Gateway interface)	

2.2.1.2 Offline Operation

Check the Offline operation check box to write communication errors to the message buffer without reboot of the project.

If the check box is not checked the communication error is displayed at the operating devices display and afterwards the project is rebooted.

Table 2-2 Offline operation

Configurable Values	Default Value
ON	X
OFF	

You must create the appropriate error messages like the following. The error codes are represented by the integrated system variables ComErrorCode and ComErrorSubcode within the message texts.

The message numbers 9901 to 9916 represent the connections 1 to 16.

9901	Communication Error, Code: 99999, Subcode: 99999
9902	Communication Error, Code: 99999, Subcode: 99999
9903	Communication Error, Code: 99999, Subcode: 99999
9904	Communication Error, Code: 99999, Subcode: 99999
9905	Communication Error, Code: 99999, Subcode: 99999
9906	Communication Error, Code: 99999, Subcode: 99999
9907	Communication Error, Code: 99999, Subcode: 99999
9908	Communication Error, Code: 99999, Subcode: 99999
9909	Communication Error, Code: 99999, Subcode: 99999
9910	Communication Error, Code: 99999, Subcode: 99999
9911	Communication Error, Code: 99999, Subcode: 99999
9912	Communication Error, Code: 99999, Subcode: 99999
9913	Communication Error, Code: 99999, Subcode: 99999
9914	Communication Error, Code: 99999, Subcode: 99999
9915	Communication Error, Code: 99999, Subcode: 99999
9916	Communication Error, Code: 99999, Subcode: 99999

Figure 2-1 Error messages for offline operation

2.2.1.3 Connection Name

Enter a connection name to any used connection.

Table 2-3 Connection name

Configurable Values	Default Value
any	PLC_LOCAL

This parameter is only available after selecting the option "V2.x (ARTI interface)".

2.2.1.4 Device Node Name

Enter a connection name to any used connection. The name must match the node name in CoDeSys.

Table 2-4 Device node name

Configurable Values	Default Value
any	PLC_LOCAL

This parameter is only available after selecting the option „V3.x (Gateway Interface)“.

2.2.1.5 Variable List *.sym/*.xml

This parameter specifies the directory in which the variable list *.sym (CoDeSys 2.x) or *.xml (CoDeSys 3.x) is stored. You have to assign a connection list for any used connection.

The variable list is created by **CoDeSys** when compilation takes place.

The programming software reads all entries from this file, which are according to the following criteria:

– the symbolic name is shorter than 80 characters.
– the line is not commented out (;)

CoDeSys enters local and global variables into the variable list *.sym/*.xml!

2.2.1.6 Controller Address

Enter the IP address or the host name for any used connection into the controller address field.

Table 2-5 Controller address

Configurable Values	Default Value
0.0.0.0 to 255.255.255.255	localhost

This parameter is only available after selecting the option "V2.x (ARTI interface)".

2.2.1.7 Gateway Address

Enter the IP address or the host name for any used connection into the gateway address field.

Table 2-6 Gateway address

Configurable Values	Default Value
0.0.0.0 to 255.255.255.255	localhost

This parameter is only available after selecting the option „V3.x (Gateway Interface)“.

2.2.1.8 Port Number

This parameter specifies the port number with up to 5 digits, which is used to communicate with the operating device. You can choose the port number freely.

Table 2-7 Port number

Configurable Values	Default Value
0 to 65535	1200

2.2.1.9 Byte Order

Select the byte order of the target for any used connection.

Table 2-8 Byte order

Configurable Values	Default Value
Intel	X
Motorola	

This parameter is only available after selecting the option "V2.x (ARTI interface)".

2.2.1.10 TCP/IP Protocol

Choose the communication channel for the TCP/IP protocol. Compare the connection attitudes to this for the attached controller.

Table 2-9 TCP/IP protocol

Configurable Values	Default Value
L2/R (level 2 route)	X
L2 (level 2)	
L4 (level 4)	

This parameter is only available after selecting the option "V2.x (ARTI interface)".

2.2.1.11 PLC Multiplexing

An application can be cross-connected on one of the n connections at runtime when PLC multiplexing is activated. For this purpose, the same data pool must be present on all configured controllers because the variable list of the connection number 1 is used for all other connections.

Switching at runtime is carried out via the system variable MultiplexPlcNumber.

Table 2-10 PLC multiplexing

Configurable Values	Default Value
On	
Off	X

2.2.2 Polling Area

The poll area is used to manage the write coordination byte (WCB), the serial message channel and the LEDs in the function keys. This area is continuously polled by the operating device.

This protocol requires you to set up the poll area with three single variables.

Table 2-11 Data types for the poll area

Area	Valid Data Types
KBS (write coordination byte)	BYTE, USINT, WORD, UINT
Message Channel	WORD, UINT
Function Key LEDs	BYTE, USINT, WORD, UINT, DWORD, UDINT, ARRAY[1..N]

The segments (KBS, message channel, LEDs) of the poll area must be defined within the same connection.

2.2.3 Status Messages

Status messages are the static assignment of flags (bits) in the controller to plain text messages in the operating device. For status message addressing, use the data types BYTE, USINT, WORD, UINT, DWORD, UDINT, or ARRAY[1..N]. The following applies when using ARRAY: The type size multiplied by N provides the size of the message system in bytes.

2.2.4 Date and Time

The variables for synchronizing the time and date must use the data types USINT or ARRAY [1..N] OF BYTE.

Table 2-12 Byte lengths for the date and time

Variable	Length
Date with a 2-digit year	3 Bytes
Date with a 4-digit year	4 Bytes
Time	3 Bytes
Weekday	1 Byte

2.2.5 Variant Buffer

The variable for the variant buffer must use the data type BYTE or USINT.

2.2.6 Tables

The variable for representation of tables must use the data type ARRAY [1..N]. The ARRAY [1..N] has to be of one of the following base data types:

- BOOL,
- BYTE,
- WORD,
- DWORD,
- SINT,
- INT,

- DINT,
- USINT,
- UINT,
- UDINT,
- REAL or
- STRING.

2.3 Error Messages

Error messages are displayed on the operating device along with a code and subcode. Error messages are composed as follows:

Communication Error

Code XXXXX

Subcode XXXXX

Retries XXXXX

Table 2-13 3S PLCHandler error messages

Code	Subcode	Error Type	Possible Cause
50	10	Error in the signaling of an event	
60	10	Error when instantiating a object of PLCHandler	
	11	A PLCHandler object could not be configured	
	12	Error at reading of variables	The connection was interrupted
70	10	No connection to the controller during a read request	
	11	No connection to the controller during a write request	
	12	Error when connecting to the control: Not all components are loaded	
	13	Error when connecting to the control: No configuration available	
	14	Error when connecting to the control: PLCHandler is not active	
	15	Error when connecting to the control: Symbols have been loaded, but there is no connection	
	16	Error when connecting to the control: No connection to the control	
	17	Error when connecting to the control: No symbol information is existing	
	18	Error reading variable, even after 3 attempts	
	19	Error writing variable	
	20	Error when scanning the network (CoDeSys 3.x only)	Wrong gateway address
	21	Error when connecting to the control: The PLC does not respond within the defined time out	

2.4 Migration of 3S sarti projects

To configure an existing project with TSwin 3S sarti protocol for the use of 3S PLCHandler proceed as follows:

1. Open the 3S sarti TSwin project.
2. Right-click on the branch **Communication** in the project tree.
3. Click on the entry **New controller**.
4. Select the entry **3S PLCHandler** in the **Protocol selection** dialog and click the **OK** button.
5. Confirm the **Controller create** dialog with the **OK** button.
6. Click on the **Yes** button in the **Use PLC addresses** dialog.

The variables are taken from the 3S sarti protocol. According to the size of the variable list this can take some time.

7. Right-click on the entry **3S PLCHandler** in the project tree.
8. Click on the item **Parameters**.

For PLC multiplexing, the same data pool (variable name, variable type) must be present on all configured controllers because the variable list of the connection number 1 is used for all other connections.

9. If necessary, activate the checkbox for **PLC multiplexing**.
10. Click on the **OK** button.

After activation of PLC multiplexing the variable list must be updated perhaps. A corresponding dialog point you at this.

11. Click the **No** button to update the list of variables.

According to the size of the variable list this process can take some time.

After you have added the 3S PLCHandler protocol successfully, the new protocol still must be activated:

1. Click on the branch **Project management** in the project tree.
2. Select the project with a click.
3. Click on the entry **Communication** in the **Properties** window.
4. Highlight the entry **3S sarti** in the column **Active protocol**.
5. Click on the **<** button to remove the protocol from the list of active protocols.
6. Highlight the entry **3S PLCHandler** in the column **Available protocols**.
7. Click on the **>** button to take up the protocol to the list of Active protocols.
8. Compile the project.

A Index

Numerics

3S PLCHandler 2-1

D

Data types
    3S PLCHandler 2-1

F

Fehlermeldungen
    3S PLCHandler 2-8

I

Important notes 1-1
Intended use 1-1

P

Protocol parameters
    3S PLCHandler 2-2

S

Safety notes 1-1

T

Target group 1-2

SÜTRON electronic GmbH
Kurze Straße 29
D-70794 Filderstadt
Phone: 0049 711 / 77098-0
Fax: 0049 711 / 77098-305
E-Mail: doku@suetron.de
Internet:www.suetron.com